COMPLEX PSD APPLICATION GUIDANCE

Table of Contents

Foreword

As developed from the Kaizen (Continuous Improvement) process, the Department has defined three categories for those projects that are complex in nature. The three categories are Complex Legal, Complex, and Complex PSD. These projects are defined as follows. Complex Legal are those projects which deal with consent orders, compliance orders, SIP, and other legal complexities difficult to control. These projects at this time are deemed to be outside of the process for Complex PSD.

The second category is defined as Complex. Complex projects are synthetic minors, netting, Voluntary Operating Permits, 112(g), non-ethanol Greenfield, Pollution Control Projects, and others. The Department has determined that Complex projects will be completed within 90 days based on having a pre-meeting and the clock starting after the pre-meeting and the complete application received by the Department.

This document is to provide a guide on how to submit a Complex PSD project (application) to the Department which is the third category. Complex PSD has been defined as any Prevention of Significant Deterioration (PSD) or Ethanol Greenfield Projects submitted to the Department. The Department anticipates completing the project within 180 calendar days of receipt of the final complete application if the applicant submits the project according to this guidance.

The goals of the Department are to provide this document to the applicant and to minimize the variability in the Complex PSD permitting process. Also, the goal of the Department is to provide a clear understanding of those items necessary for the Department to successfully issue a PSD construction permit within 180 calendar days. It is also the intent of the document to provide definitions of the terminology used in the PSD program and provide requirements necessary to submit a complete PSD application to the Department. The Department desires to continue to work with constituents to continuously improve the understanding of the Complex PSD program.

I. PSD OVERVIEW

Before construction, *new major stationary sources* and *major modifications* to existing major stationary sources are required to obtain a construction permit under the New Source Review (*NSR*) provisions of the Clean Air Act (*CAA*). The Iowa Department of Natural Resources Air Quality Bureau (*Department*) does not charge any fees for construction permitting. Construction permitting is a separate program from the Title V Operating Permit program under the CAA.

In attainment and unclassifiable areas, such as Iowa, the NSR program is implemented under the Prevention of Significant Deterioration (*PSD*) program. Iowa is a State Implementation Plan (*SIP*) approved state, and currently implements the March 12, 1996 version of 40 CFR 52.21 as approved for the State of Iowa. The Department has not adopted the EPA's Dec. 31, 2002 NSR reform package yet.

The Department is responsible for all PSD permitting. However, plants located in Polk or Linn Counties need to involve the local program. Local program websites are:

Linn County:	http://www.air.linn.ia.us/
Polk County:	http://www.airquality.co.polk.ia.us/

The goals of the PSD program are to protect human health and welfare while ensuring that economic growth can continue. This is achieved while preserving local air quality and in areas of special value, such as national parks and wilderness areas, also known as Class I areas.

These goals are accomplished by reviewing PSD applications to ensure they comply with the National Ambient Air Quality Standards (*NAAQS*), the applicable PSD *increment* concentrations, and the requirement to apply Best Available Control Technology (*BACT*) on significant emissions. For increment concentrations, the state of Iowa is considered to be a Class II area.

The review process will also include any relevant New Source Performance Standards (*NSPS*), National Emission Standards for Hazardous Air Pollutants (*NESHAP*), and Maximum Available Control Technology (*MACT*) standards, as well as evaluating *visibility impacts*, *energy and environmental impacts*, *soils and vegetation impacts*, and *growth impacts*.

II. PRECONSTRUCTION MONITORING

Significant emission rates require preconstruction monitoring for that pollutant. This can be satisfied in several methods: use of private air monitoring for at least one year, use of existing Department air data, or modeling below significant monitoring levels.

Prior to reviewing the PSD application checklist and filling out applications, your company shall determine if pre-construction monitoring is required. At least one year of air quality data should be used that represents the period immediately prior to the PSD application submittal date for any criteria pollutant that the applicant proposes to emit in significant amounts. Data from the Department air monitoring sites may be used. It is found at:

http://www.iowacleanair.com/current/files/monsites12_02.pdf

If using Department monitor data, there is no need to supply quality assurance documentation, but include a justification that the data is sufficient.

If the Department data cannot be utilized, your company may need to operate a site-specific air monitoring network. In this case, applicants will need to submit quality assurance documentation for the monitoring results and siting location for approval. See the links at the end of this document for more detail.

Alternatively, using modeling, if either the predicted ambient impact or existing ambient pollutant concentrations are less than the prescribed significant monitoring value, the Department may exempt the applicant from preconstruction monitoring. For details, contact the permit engineer assigned to the project or call 1-877 AIR IOWA for assistance.

III. PERMITTING PROCESS OVERVIEW

PSD Application Checklist

Before undertaking a PSD project, please review the PSD Application Checklist. The checklist is located at:

http://www.iowacleanair.com/prof/const/files/psd_checklist.pdf

This guidance document explains in detail each item found on the checklist.

Pre-Application Meeting

The applicant must request a pre-application meeting with the Department to outline the project. The Environmental Protection Agency (EPA) regional office (Region VII) is invited as well. This meeting is used to discuss modeling protocols, preconstruction monitoring, whether this will be a phased project, BACT analysis expectations such as analysis requirements and technologies for evaluation, communication strategies and expectations, and for setting a project schedule. At least one week before the meeting, an application that is at least 75 percent complete and an agenda outlining the meeting is to be submitted to the Department for review. The submittal allows the Department an opportunity to offer insight on the content and quality of the proposed project and to clarify items needed to further complete the application. All construction permit forms (for all emission units in the project, not just those that are PSD major) are found at:

http://www.iowacleanair.com/prof/const/conform.html

PSD applications also require modeling files and results for NAAQS, increment, additional impacts and visibility, as well as, BACT analysis, and other impact analysis for energy, environmental, etc.

Submit Complete Application
At least four copies of the complete application are required for PSD projects – a fifth may be required if the project is in Polk or Linn Counties. If confidentiality is requested, two (2) confidential versions in addition to the other aforementioned applications need to be submitted.

Project Review and Issuance of Permit(s)
Once submitted, the project is assigned to a permit engineer, and reviewed for completeness. The modeling files are given to a modeler for review as well. Once the permit engineer begins the review, any additional information is requested. Once all questions are answered, the modeling accepted, and other requirements agreed between the company and the Department, the permit engineer will write draft permits and send copies to EPA and the applicant for a brief review. Assuming no comments require a major rewrite, the draft permits are sent for a 30-day public comment period. A public hearing will also be set. Once the public comment period is ended, the Department will review all comments from EPA, the applicant, and the public and either issue the permits or revise them in response to comments. A significant rewrite of the draft permits in response to comments may require a second 30 day public comment before final issuance.

To obtain an expedited PSD permit, it is vital that applicants respond promptly to any information requests from the Department. Once the construction permit is issued, a Title V Operating Permit or application will need to be modified or submitted. For details contact the Title V section at (515) 242-5100.

IV. COMPLEX PSD SUBMITTAL ITEMS

Required Application Forms
All required application forms can be downloaded from:

http://www.iowadnr.com/air/prof/const/conform.html.

A brief description of all required forms is below. All forms, unless otherwise stated, must be included for application completeness.

Form FI
Used for basic company information such as contacts, location, mailing address, etc. A responsible official could be the owner or president, a designated representative of the owner or president, or a person who works for company and prepared the application.

Form EU, EU1 and EU3
Used to describe the new (including replacement units) or modified emission units in the project. Forms EU1 and EU3 are specialized forms used for generators (EU1) or paint booths (EU3). If you fill out EU1 or EU3, you do not have to fill out a form EU for that unit. If adding a new emission unit, that will exhaust through a currently permitted emission point, check the "permit modification" box and give the permit number, rather than checking the "new permit" box.

Form EC
Used to provide emission calculations for each new emission unit. Please document the emission factor source. For example, if basing predicted emissions off stack test results from a similar source, include the stack test report and note any differences from the units tested and permitted. Please do not use expected outlet concentrations, such as an argument that a baghouse can always meet 0.01 gr/scf.

Form CS
Documents the control equipment (if any) and stack information for each emission unit(s). Please check and ensure that the stack information on the Form CS is the same used in modeling. This form is not required for fugitive emission units.

Form EI
Documents current plant totals for all pollutants from all emission units installed at the plant. It includes all units that are exempt and states which exemption is being used and the emissions from that unit. This includes units that vent indoors. It also includes fugitive emissions. The Department may ask for additional documentation on why units installed or modified within several years before application submittal were not considered part of the project under review.

Form MI-1
Modeling Information Plot Plan. This needs to include a scale bar, north arrow, property boundaries, the location of each emission point, and all building heights. Include buildings that are off-site but near property boundaries.

Form MI-2
Modeling Information Emission Point Characteristics – Information from all units. Please use the potential-to-emit emission rate (based on permit allowable) rather than actual emissions. This form is not the same as Form EI. Both forms must be included.

FRA
Federal Regulation Applicability. These are federal regulations, found in the Code of Federal Regulations (CFR).

> New Source Performance Standards (*NSPS*) set maximum emission levels for various types of emission units, like boilers or storage tanks, found in 40 CFR Chapter 60. NSPS applies to all emission units of that type, not just major sources. The BACT level cannot be set at a less stringent level than the NSPS limit, but can be more stringent.
>
> National Emission Standards for Hazardous Air Pollutants (*NESHAP*) are for various hazardous air pollutants, such as mercury, found in 40 CFR Chapters 61, 62 and 63. Like NSPS, these apply to all applicable emission units at major sources of HAP.

Maximum Available Control Technology (*MACT)* standards set control levels based on process type. Almost all MACT standards apply only to sources which are major for hazardous air pollutants (HAP), i.e., have plant-wide emissions greater than 9.4 tpy of any single HAP, or greater than 24.4 tpy for all HAP combined. Some MACT standards apply to non-major (area) sources as well. These are found in 40 CFR Chapter 63. If your project will be major by itself for HAP, but does not have a MACT standard that applies to it, you will be affected by 112(g) requirements, and will need to discuss these requirements with the Department at the pre-meeting.

Emission Calculations
Emission calculations are required to be completed by the applicant to identify the emissions from each emission unit(s) to the associated control if applicable, and the emission point(s). This section helps identify the items needed by the Department to verify emissions and determine that compliance with applicable regulations is achieved.

Net emissions increase for the project
This should summarize the increase in each pollutant whether PSD significant or insignificant for the project as a whole. Also include fugitive emissions, for instance, from haul roads, if the stationary source is one of the named 28 sources. Emission units that are normally exempt from permitting requirements under Iowa Administrative Code (IAC) 567-22.1(2) must also be included.

Associated emissions increases
Are emissions from sources not being installed or modified, but that will increase due to the project. An example is debottlenecking. If an existing production line unit is running at less than its maximum capacity due to capacity constraints in the production line, but runs at a higher capacity after the project, it is debottlenecked. Even though the debottlenecked unit was not modified, the additional emissions from that unit due to higher capacity will count towards total emissions increase for the project.

Documentation to support emission calculations
This refers to material that supports any assumptions made in your emission calculations. This could include stack test results, material safety data sheets (MSDS), manufacturer's specifications, pilot plant results, etc. If referencing EPA's AP 42 emission factors, just reference, do not copy of the relevant AP 42 chapter.

Common control / support facility determination
A supporting facility conveys, stores, or otherwise assists in the production of a principal product of another plant. If a plant is determined to be a support facility, its emissions are combined with the emissions of the primary plant when determining PSD applicability. Three criteria determine if a facility is a support facility:

1) The facility is contiguous or adjacent to the principal plant
2) Shares the same industrial grouping, and
3) is under common control.

Current EPA guidance indicates that the support facility determination depends on the degree of integration between the facilities and several other factors. It is possible that a facility that does not share the same industrial grouping as the principal activity can be considered a support facility. If the activity of the support facility clearly supports the manufacture of the principal product, then EPA guidance clearly indicates the supporting facility shares the same industrial classification of the principal facility. In addition, common control can be based on a "common-sense" notion of control, shared ownership, etc. All support facility determinations are unique and accordingly the Department reviews all on a case-by-case basis.

BACT Analysis

A BACT analysis is required for each listed pollutant whose potential-to-emit for the project is greater than the applicable significance level. A BACT analysis for opacity is required for any pollutant that could result in visible emissions.

Top-down BACT analysis

The department uses a top-down BACT analysis for evaluating BACT options. The EPA's RACT/BACT/LAER Clearinghouse can provide a starting point for investigating technology options. LAER is Lowest Achievable Emission Rate, and is used in non-attainment areas. Although Iowa does not currently have any non-attainment areas, any available LAER technologies must be included in the analysis. A comprehensive list of control options shall include inherently lower-emitting processes or work practices, add-on controls, or a combination of all of the above. In cases where effectiveness of control technology can vary considerably with expense, both options should be evaluated separately. An example is a thermal oxidizer at 90 percent efficiency versus 98 percent efficiency.

Technically feasible

Any control option installed and successfully operated at a similar source is considered feasible. If a control has not yet been demonstrated in operation, the applicant must determine the availability. This is based on factors including commercial availability, if it realistically be installed and operated, and status in the licensing and commercial demonstration stage. The applicant can demonstrate that a control is not technically feasible by showing to the Department that it is not commercially available or that unusual circumstances prohibit its successful use. If modifications are needed to make the control compatible with the emission unit, it does not necessarily mean the control technology is technically infeasible. Such costs should be considered in the economic feasibility part of the BACT analysis.

Technology transfer

Technology transfer applies to technologies not currently being used in a specific industry, but used in other industries. For example, SNCR is a standard control technology in boilers, so it may be useful in cement kilns, which also have NO_x emissions due to high combustion temperatures. Technology transfer should always be included in the BACT analysis where appropriate.

Rank remaining technologies in order of effectiveness.
All applicable technologies should be ranked in terms of most to least effective in terms of emission reductions potential. A common unit of measure shall be determined and used to rank the technologies. For instance, percent reduction or emissions per unit produced.

After listing each option in terms of most to least effective, applicants should display the expected efficiency (as percent reduction or emissions per unit), the expected emissions rate, and expected emissions reduction from baseline in tpy for each pollutant subject to a BACT analysis for each control option.

Evaluate most effective controls and document results
This is a case-by-case evaluation of economic, energy and environmental costs. Economic review involves evaluating the cost to control the pollutant or cost effectiveness compared to cost effectiveness at similar facilities. It does not involve evaluating a source's ability to absorb such costs.

The control cost analysis combines the annualized capital cost of the controls with its annual operating expenses. This annual control cost is divided by the quantity of pollutant in tpy that the control technology will reduce to arrive at the dollars per ton value used for comparisons. The cost analysis should be compared to the OAQPS Control Cost Manual for consistency with other BACT analyses performed across the country. The website for the OAQPS Control Cost Manual is:

http://epa.gov/ttn/catc/products.html#cccinfo

The applicant should include copies of the vendor price quotes, where applicable, and also document and substantiate any deviations from the OAQPS Cost Control Manual. Interest rates used to figure annualized capital costs should be the applicable commercial bond rate (Moody's seasoned AAA) at the time of the submittal. If the top or most efficient BACT option is selected by the applicant, there is no need for an economic evaluation, as only those options which the applicant considers an option to be economically infeasible require further review by the Department. Similarly, the applicant does not need to do economic analyses for options that are less efficient than the one selected as BACT.

Visibility impacts
This requirement is distinct from the visibility analysis required if your project is within range of a Class I area. The suggested components of a good visibility impairment analysis are a determination of the visual quality of the area, and then an initial screening of emission sources to assess the possibility of visibility impairment. If the screening model suggests the need, a more in-depth analysis may be done.

Energy impacts
Energy impacts are the direct energy penalties or benefits that can result from using a control technology. This includes quantifiable extra fuel or electricity costs required to

power a control option. Energy impacts are usually done in terms of cost in the economic feasibility evaluation of BACT. The applicant may consider concerns over a fuel that is scarce or not available locally at the time of the application. The Department does not consider concerns that currently available fuels may become scarce.

Environmental impacts
Environmental impacts are impacts due to a control option beyond any air quality standard such as NAAQS, increment, etc. Examples are scrubber discharges of polluted water, visibility impacts, or odor. If control technology emission reductions are small compared to other adverse environmental impacts, the control option may be eliminated. However, applicants must show unusual site-specific characteristics why such waste disposal or pollutant emissions are unreasonable and create greater problems at the site under review than at other sites where the control is used. This review of environmental impacts must be performed even if the most stringent option is selected as BACT. The environmental impact should include an evaluation of water and/or solid waste disposal requirements, if applicable. Also, as stated in the North County Remand (http://www.epa.gov/Region7/programs/artd/air/nsr/nsrmemos/analysis.pdf), a less efficient technology could be picked if it reduces other emissions (i.e. HAP) more effectively.

Soils and vegetation impacts
This is based on an inventory of soil and vegetation types found in the area of impact. This inventory should include all vegetation with any commercial or recreational area. Note that it is not sufficient to state that as the source models below the NAAQS, no impact is expected - the applicant needs to check that there are no sensitive species which could be harmed by long-term exposure to pollutant concentrations below the NAAQS as well.

Growth impacts
The application needs to include a growth projection for associated industrial, commercial or residential areas due to the proposed project, along with an estimate of air emissions from this growth. Associated growth emissions do not count towards the plant's total pollutant emissions as far as determining PSD project status, unless it is determined that an associated industrial plant qualifies as a supporting facility.

Select BACT
The most effective option that is not ruled out is BACT. BACT is the emission rate and averaging time not a specified control technology.

Proposed Permit Conditions
This is an optional part of the checklist. All proposed conditions may not be included by the Department in the final permit. If the applicant chooses to propose limits, averaging times, recordkeeping, or other conditions, the reasoning behind the proposed conditions must be documents especially if they are less strict than in other comparable BACT determinations. It is a good idea to propose recordkeeping language as a company generally knows what records are easily kept.

V. DISPERSION MODELING ANALYSIS

The dispersion modeling analyses and the additional impact analysis required for PSD projects are discussed in a separate document titled "Air Dispersion Modeling Guidelines for PSD Projects" which can be found here:

http://www.iowacleanair.com/prof/progdev/files/psd_modeling_guideline.pdf

This document includes guidance on preparing a modeling protocol, conducting the preliminary and refined (NAAQS and PSD increment) modeling analyses as well as the growth, soils and vegetation, and visibility evaluations required in the additional impact analyses. Although there are no Class I areas within 100 kilometers of Iowa's borders, the possible Class I area impact analysis requirement are also discussed in this document.

VI. DEFINITIONS

The following words have been used in the application guidance document but were not defined. This section defines those terms.

Average cost effectiveness
the annualized control cost ($) divided by (uncontrolled annual emissions in tpy – controlled annual emissions in tpy). Uncontrolled emissions (or baseline) are established using realistic upper boundary operating assumptions.

Baseline
Maximum annual uncontrolled emissions rate, in tpy, used in determining the average cost effectiveness. This is based on a realistic operating scenario assuming maximum production. Note that the baseline (i.e., units produced) must remain the same for each option in the BACT analysis.

Baseline date
This is the date used in increment analysis as the "original" air quality to be evaluated against.

Best Available Control Technology
(BACT) is part of the review process for PSD. It ensures that the most efficient control on a case-by-case basis that is both *technically* and *economically feasible* are installed on a new major source or major modification. It includes a search of similar permitted projects (see the EPA's BACT/LAER Clearinghouse) and discussion of controls. Iowa uses the "top-down" approach, where all possible control technologies and options are identified for each pollutant subject to PSD. Potential control options include inherently lower emitting processes or work practices, add-on controls, or a combination of the above. *Technically infeasible* options are then excluded. The remaining options are then ranked in terms of emission reduction potential, from most effective to least. This ranking should include the expected emission rate for each option (total and per unit product) and expected emissions reduction (in tons per year). Add-on controls that can have very different efficiencies and costs should be evaluated as a separate option for

each efficiency/cost. The top option is then evaluated on energy, environmental and economic impacts. If the top option is demonstrated to be infeasible, the evaluation continues to the next best option. Once an option if found to be both economically and technically feasible, there is no need to analyze the options below it in rank. It is important to document this process and inputs, such as including vendor quotes on the cost of each technology, assumptions used in the economic analysis, baseline production, etc. (Note that opacity limits must also be set as BACT, along with the criteria pollutants)

Increment

Increment standards represent the maximum allowable increase in pollutant concentrations for the applicable criteria pollutants. Unlike the NAAQS, the increment levels are set to keep the existing air quality, (or baseline, set at the time of the first PSD application in the area) from being degraded. Iowa is a Class II area for increment.

National Ambient Air Quality Standards (NAAQS)

These are federal standards that set the maximum levels at various averaging times for the criteria pollutants (carbon monoxide, ozone, particulate matter 10 microns or less (PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_x) and lead). The primary standards are set to protect human health, while the secondary standards are set to protect public welfare (i.e., soils, vegetation and buildings).

Stationary Source

A "*stationary source*" generally includes all pollutant-emitting activities which belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under common control. A "major stationary source" is any source type belonging to a list of 28 source categories which has the potential to emit 100 tons per year or more of any single criteria pollutant, or any other source type which has the potential to emit more than 250 tpy. Emissions from *supporting facilities* are included in the total. Fugitive emissions are included only if they are one of the 28 named source categories. Note that ethanol plants are considered one of the 28 named source categories.

VII. ADDITIONAL RESOURCES

Department BACT FAQ

http://www.iowacleanair.com/prof/const/files/bact_faqs.doc

Department contact page

http://www.iowacleanair.com/contact/aqconros.html

Department information on endangered/sensitive species

http://www.iowadnr.com/other/threatened.html

Department regulations (IAC 567)

http://www4.legis.state.ia.us/IAChtml/567.htm

Draft EPA 1990 Workshop Manual

http://www.epa.gov/region07/programs/artd/air/nsr/nsrmemos/1990wman.pdf

EPA AP-42 emission factors

http://www.epa.gov/ttn/chief/ap42/index.html

EPA Headquarters NSR Website

http://www.epa.gov/nsr/

EPA Region VII NSR Website

http://www.epa.gov/region7/programs/artd/air/nsr/

EPA requirements for monitoring quality assurance documentation (QAPP, QMP, and SOPs)

http://www.epa.gov/quality/qatools.html

htpp://www.epa.gov/ttnamti1/files/ambient/qaqc/redbook.pdf

OAQPS Cost Manuals

http://epa.gov/ttn/catc/products.html#cccinfo

RBLC Clearinghouse

http://cfpub.epa.gov/rblc/htm/bl02.cfm